

However, each of the chief types of savagery possesses in some form the three great classes of bruising, slashing, and piercing weapons. For instance, the Polynesians had the club, the spear, and the shark's-teeth sword. The Africans fought with knobsticks, assegais, bows and arrows, and edge weapons in great variety. The Americans, especially the Mexicans, developed a sword with obsidian edge and the tomahawk.

The further subdivision of these three classes of weapons is based upon their manipulation. Every weapon and every tool consists of two parts—the working part and the manual or operative part,—that which wounds or kills and that by which it is held or worked. Indeed, the fact is sometimes overlooked that the manual or operative part of a tool or weapon has undergone greater changes in the course of history than the working part. The bow therefore must be studied quite as carefully as the arrow.

In the rudest form of tool or weapon a single piece of stone or wood serves both purposes, but even in this simple form one part fits the hand better and the other is more adapted to the work. A stone used for bruising generally has one end better fitted to the hand and the other shaped by nature to effect the purpose. The stick used as a spear, or a club, or a sword, even in savagery, has the differentiation of holding end and working end.

This study of the manual end of a weapon gives rise to the classification of Adrien de Mortillet into weapons held and used in the hand, weapons thrown from the hand, and weapons worked by some intermediary apparatus between the hand and the working part.

Ballistic weapons of America are bolas, throwing-sticks or sling-boards with their varied darts, slings and stones, blow-tubes and darts, and bows and arrows. Some tribes are said to throw the tomahawk with good effect. Each of these involves mechanical principles worthy of the most careful study.

In this paper attention will be confined to the types of bows, arrows, and quivers of the North American aborigines, with incidental references to similar forms found elsewhere. It is true that the tribes included within this area developed the greatest variety of forms of primitive bows and arrows. The built up bows of Asia, studied and described by Mr. Balfour,\* are of a higher order of invention and need only be mentioned.

Mexican bows, arrows, and shields have been carefully described by Mr. Adolf Bandelier. The South American area has been little investigated, but the North American Indian archery affords an excellent opportunity for the consideration of all the forces and devices which entered into human inventions as motives.

The geographic distribution of materials for weapons and of game

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\* Henry Balfour, *Jour. Anthropol. Inst.*, London, vol. xix.